Instructions

Snap-on®

Torque Wrenches

TO GET ACCURATE TORQUE READINGS —

Your torque wrench is a precision instrument. Given proper care it should give many years of satisfactory use. For best results and accurate readings follow the instructions given below and on page 3.

Torqometers

1. Set the dial of the Torqometer by using method "A" or "B" explained below.

   Method A:

   a) Turn the dial until the pointer is on zero.

   b) Place the Torqometer on the fastener.

   c) Pull until the pointer reaches the torque required.

   Method B:

   a) Turn the dial until the pointer is at the inch or foot pound mark required. (On right hand threads set to the left of zero. On left hand threads set to the right of zero.)

   b) Place the Torqometer on the fastener.

   c) Pull until the pointer reaches zero.

2. To make it easier to read the dial, it is possible to place the pointer in any desired position. Turn the dial until the pin bears against the pointer. Then turn both the pin and the pointer ¼ turn past the position desired. Finally, turn the dial in the other direction. The pointer will follow the pin back until it reaches the position desired. Then proceed with either Method "A" or "B," as explained above.

3. Each time the Torqometer is used, be sure that the dial and pointer are set correctly.

4. After each use of the Torqometer make sure the pointer returns to the pre-set value. If not, re-set the dial and pull again.

5. For an accurate reading, the final turn of the nut should be made with the Torqometer.

6. The hub of the pointer contains a clutch which allows the stem to turn within the hub if a sudden impact occurs. This important safety factor protects the dial mechanism from shock damage. If a fastener suddenly breaks, it may change the pointer setting. Reset the dial and proceed as before.

7. Work on fasteners with clean and lubricated threads.

8. Your Torqometer does not need lubrication. Do not attempt to oil it.

Click-Type Torque Wrenches

To Set the Desired Torque:

1. Unlock the torque wrench setting by turning the lock ring clockwise (viewed from the bottom). An arrow above the lock ring also indicates how to unlock the torque wrench.

2. The desired torque can be set by turning to the number indicated on the barrel. Line up the zero on the sleeve with the center line on the barrel (See figure 1). Then add the reading obtained by turning the sleeve clockwise as shown in figure 2.

3. Lock the torque setting by turning the lock ring counter-clockwise, as shown by the arrow above the lock ring. The torque wrench is then ready for use.

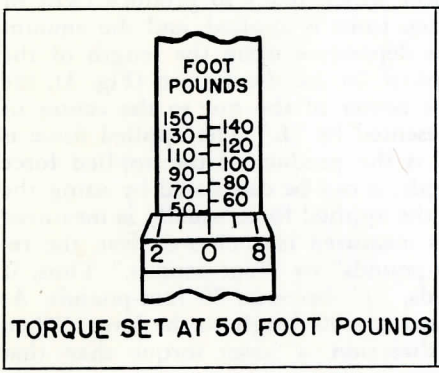


Figure 1

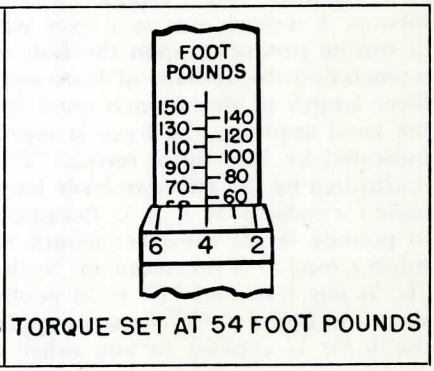


Figure 2

Correct Use of the Torque Wrench:

The correct amount of torque has been applied when the wrench makes an audible click while the handle moves freely for a few degrees. This combined sound and movement indicate that the selected torque has been reached. The torque wrench can be used for either a clockwise or counter-clockwise application. It is not necessary to re-set the wrench unless a different torque setting is desired.

A Few Suggestions:

1. If the torque wrench has not been used for some time, operate it several times to re-distribute a thin film of lubricant on the working parts.
2. To assure an accurate torque application keep your hand centered on the handle grip while using the torque wrench.
3. Don't forcibly unscrew the handle grip below the lowest torque reading.
4. Don't forcibly turn the handle grip with the lock ring in the "Lock" position. This could damage the locking device.
5. Do not apply more torque than the rated capacity of the torque wrench.
6. Always store the torque wrench with the torque setting in a *low position.*

HOW ADAPTORS AFFECT TORQUE

To understand why some extensions and adaptors change or alter the torque at a bolt, a brief explanation of what is meant by "torque" and how it is measured is helpful. Theoretically, "torque" is the movement of a system of forces around an object which tends to produce twist or torsion. A wrench acts as a lever when force is applied, and the amount of torque produced upon the bolt is dependent upon the length of the wrench and the amount of force applied. In the illustration (Fig. 3), the lever length of the wrench from the center of the nut to the center of the hand applying the force is represented by "L." The applied force is indicated by "F." Since torque "T" is the product of the applied force multiplied by the effective lever length, it can be calculated by using the basic formula: $T = F \times L$. Because the applied force usually is measured in pounds, while the lever length is measured in inches or feet, the resulting torque is measured in "inch-pounds" or "foot-pounds." Thus, if "L" is one foot and "F" is 30 pounds, "T" becomes 30 foot-pounds. As shown in figure 3, "F" must be applied at a 90° angle to the lever. When the force is applied in any other direction, a lesser torque than that calculated is exerted by the wrench.

An examination of the formula and the illustration brings out the following points:

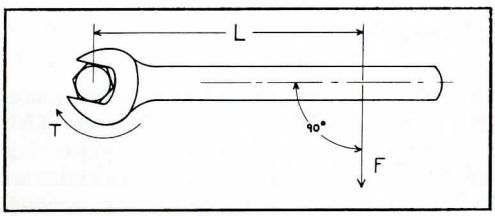


Figure 3

a) Increasing the lever length "L" increases the torque if "F" remains constant. If "L" is changed to 2 feet, then "T" becomes 60 foot-pounds, even though "F" remains at 30 pounds.

b) Decreasing the lever length "L" decreases the torque if "F" remains the same.

c) The torque "T" is proportional to "F" if "L" remains unchanged Thus, if "F" is 30 pounds while the torque is 30 foot-pounds and then "F" is increased to 60 pounds, torque or "T" then becomes 60 foot-pounds.

A torque wrench has a built-in device which indicates to a mechanic when he has exerted the desired amount of torque on a bolt or nut. A reading is made directly in foot-pounds or inch-pounds. However, when accessories which add lever length are used with torque wrenches, special corrections must be made.

Adaptors or extensions are attached to the square drive of a torque wrench for the following reasons:

1. To attach the torque wrench to various types of fasteners or fittings so that torque may be applied.
2. To gain access to locations which cannot be reached with the torque wrench alone.

HOW TO COMPUTE TORQUE WHEN USING ADAPTORS

If an adaptor or extension is attached to the square drive of a Torqometer or a click-type torque wrench and this adds to its length, then the applied torque will be greater than the dial reading or the pre-set torque. A formula can be used to find what the dial should read or what the pre-set torque should be in order to obtain the correct applied torque.

Here is the formula:

$$\text{Dial Reading or Pre-Set Torque} = \frac{\text{Torque Wrench Length} \times \text{Torque Desired}}{\text{Torque Wrench Length} + \text{Extension Length}}$$

$$\text{This becomes: } RS = \frac{A \times T}{A + B} \text{ when}$$

RS = Dial reading or torque setting of the torque wrench.

A = Distance from the center of the square drive of the torque wrench to the center of the handle grip.

B = Length of the adaptor from the center of the square drive to the center of the nut or bolt. Use only the length which is parallel to the handle. See figures 4 and 5.

T = Torque desired. This is the actual torque applied to the fastener.

Here is a typical problem: What should the dial read or the setting be when "A" is 12″, "B" is 6″ and "T" is 30 ft. lbs.?

$$RS = \frac{A \times T}{A + B} \text{ or } \frac{12 \times 30}{12 + 6} \text{ or } \frac{360}{18} \text{ or 20 ft. lbs.}$$

Therefore 30 foot-pounds of Torque will be applied at the fastener when "RS" is 20 foot-pounds.

Note: If the torque wrench reads in foot pounds, then "T" should also be in foot pounds. "T" and "RS" should be in the same unit of measurement. "A" and "B" should also be the same unit of measurement.

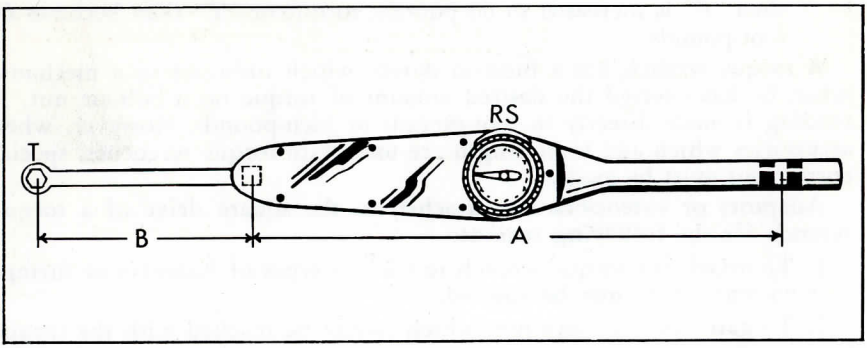


Figure 4 — Formula values for a Torqometer

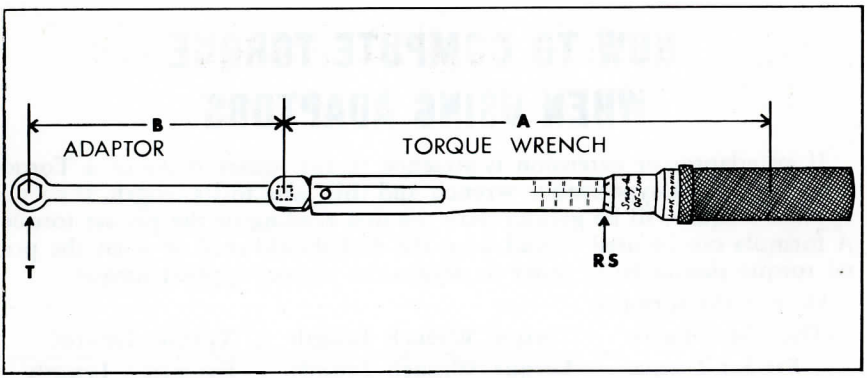


Figure 5 — Formula values for click-type torque wrench

Types of Adaptors

The problem just explained gives a very simple conversion using a straight extension. However, there are many types of adaptors and extensions. A few are shown in figures 6, 7, 8 and 9, but in each one, note that only the added extension from the square drive of the Torqometer increasing its length will change the readings. Note that an extension which is perpendicular to the Torqometer, regardless of length, does not affect the readings. The same principles apply to click-type torque wrenches except the ratcheting flex drive type while in the flexed position.

A Snap-on torque computer is available (form number SS-306A) which gives quick and accurate revised dial readings or torque settings when various types of adaptors are used. Ask your *Snap-on* representative about this time saving device.

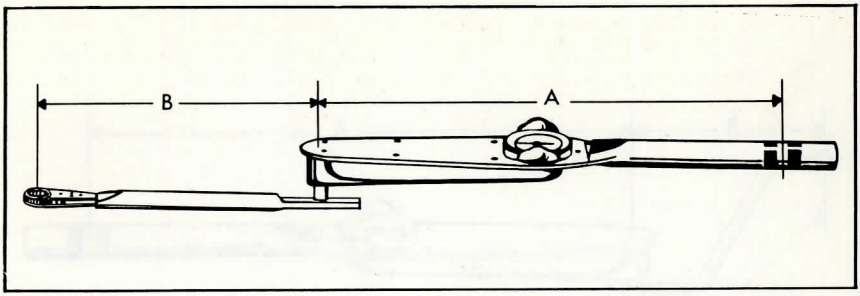


Figure 6

This adaptor changes the length and leverage of the Torqometer. The dial will read only a portion of the torque. A correction must be made.

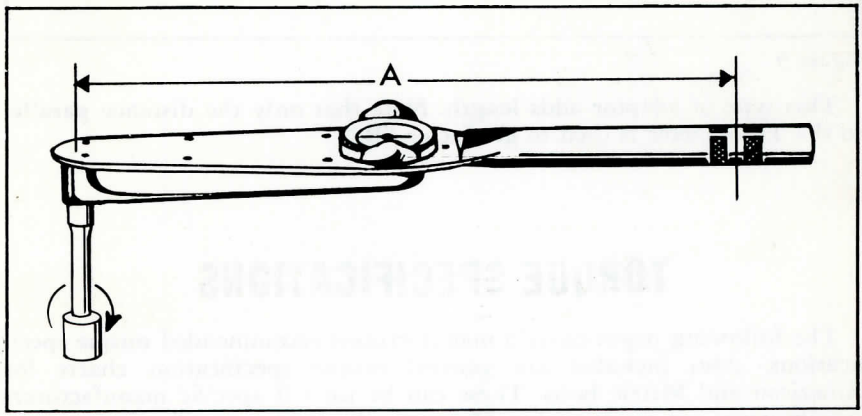


Figure 7

The extension above does *not* affect torque because it does not increase the length of the Torqometer. Factor "B" is not involved therefore no correction is necessary.

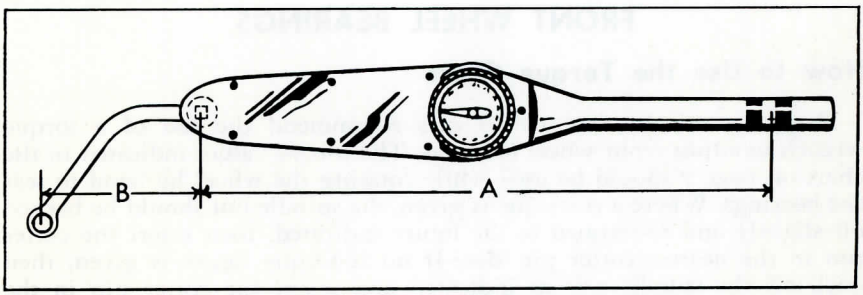


Figure 8

This adaptor affects the dial reading. Factor "B" is added and therefore a correction is necessary. Note that "B" is not the length of the adaptor but only the increase in length parallel to the Torqometer.

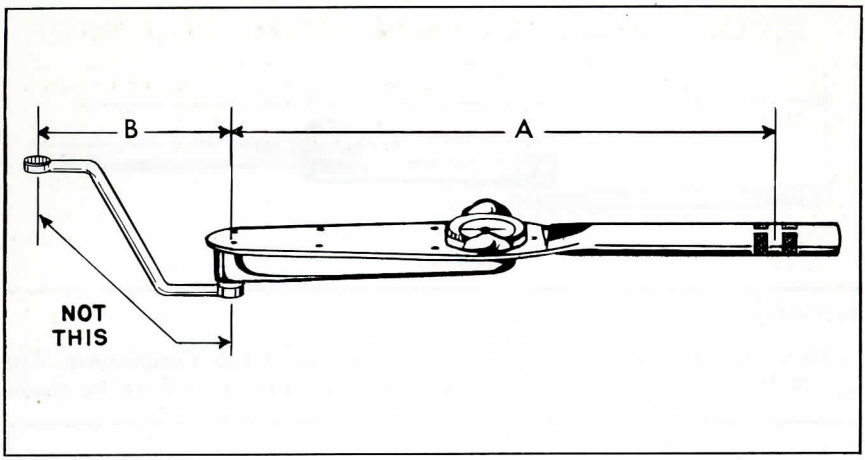


Figure 9

This type of adaptor adds length. Note that only the distance parallel to the Torqometer is used to get factor "B."

TORQUE SPECIFICATIONS

The following pages contain manufacturers recommended torque specifications. Also included are general torque specification charts for American and Metric bolts. These can be used if specific manufacturers specifications are not available. However, the torque specifications recommended by manufacturers should always be used whenever possible in preference to those shown on the general chart. All specifications given are for clean and lubricated threads.

FRONT WHEEL BEARINGS

How to Use the Torque Chart

Shop manuals for late model cars recommend the use of a torque wrench to adjust front wheel bearings. The torque values indicated in the chart on page 9 should be used while rotating the wheel by hand to seat the bearings. Where a re-torque is given, the spindle nut should be backed off slightly and re-torqued to the figure indicated, then insert the cotter pin in the nearest cotter pin slot. If no re-torque figure is given, then back off the spindle nut as indicated and insert the cotter pin in the nearest cotter pin slot.

Most cars have changed to tapered roller bearings on late models, and the torque values recommended for each type shown are in the chart. *All figures shown are foot pounds unless otherwise indicated.*

TORQUE CHART FOR FRONT WHEEL BEARINGS

CAR — MODEL	BALL BEARINGS		ROLLER BEARINGS	
	Ft. Lbs. Torque	Re-torque or back off	Ft. Lbs. Torque	Back off
BUICK (All)	25-30	12	19	1/6 turn
CADILLAC	25-30	12	30	1/4 turn
CHEVROLET	28	12	12	1/6 turn
CHRYSLER	—	—	7-1/2	1 slot
CORVAIR	—	—	12	1/6 turn
DODGE, DART	—	—	7-1/2	1 slot
FORD	—	—	17-25	1/2 turn•
LINCOLN	—	—	17-25	1/2 turn•
MERCURY	—	—	17-25	1/2 turn•
OLDSMOBILE*	17	4	30	1/2 turn
OLDSMOBILE (F-85)	10-15	1/4 turn	30	1/2 turn
PLYMOUTH	—	—	7-1/2	1 slot
PONTIAC	17	4	10-16	1/4 turn
RAMBLER, AMC	—	—	20	1/3 turn•
STUDEBAKER	—	—	15	1/6 turn
TEMPEST	17	4	10-16	1/4 turn
VALIANT	—	—	7-1/2	1 slot

*For front wheel drive models, adjust rear wheels to these specifications.
•Retighten to 12 inch pounds.

TORQUE SPECIFICATIONS FOR PASSENGER CARS

(Figures shown are foot pounds)

CAR MODEL	Cylinder Heads	Connecting Rods	Main Bearings	Manifold Nuts Intake	Manifold Nuts Exhaust	Spark Plugs
BUICK						
1958-63	63-73	40-45	100-110	25-30	10-15	25-30
1961-63 Special V-8	50-55	30-35	50-55•	25-30	10-15	15-20
1962-63 Special V-6	65-70	30-35	100-110	25-30	10-15	25-30
1964 Special V-8	65-70	60-75	50-55•	25-35	10-15	25-35
1964 Special V-6	—	60-75	65-70	25-35	10-15	25-35
1964-65 401, 425	65-75	40-45	100-110	25-30	10-15	25-35
1965 V-6, 300	65-80	30-40	95-120	25-30	10-15	25-35
1966-67 V-6	70-75	30-40	95-120	45-55	15-20	25-35
1966 400, 401, 425	65-80	40-50	80-110	25-35	10-15	25
1966-69 300, 340, 350	65-80	30-40	95-120	45-55	15-20	25-35
1967 400, 430	100-120	45-50	80-115	45-55	15-20	15
1968-70 400, 430, 455	100	45	110	50-55	18	15
1968-71 6 cyl.	95	35	65	20-30	25	25*
1970-72 350	75	35	95	55	18	15
1971-72 455	100	45	110	65	18	15

•End 65-70

*15 for 1971-72 models

TORQUE SPECIFICATIONS FOR PASSENGER CARS

(Figures shown are foot pounds)

CAR MODEL	Cylinder Heads	Connecting Rods	Main Bearings	Manifold Nuts Intake	Manifold Nuts Exhaust	Spark Plugs
CADILLAC						
1961	65-85	40-50	80-105	20-30	30-35	20-30
1962-63	75	45	95	25-30	60	20-30
1964-65	60	40	95	30	58	25
1966-67	60	40	90-95	25	60	25
1968-72	115	40	90	30	35	25
CHEVROLET						
1960-62 6 cyl.	90-95	33-45	100-110	25-35	—	25
1960-64 283, 327	60-70	30-35	60-70	25-35	* *	25
1960-64 348, 409	60-70	35-45	95-105	25-35	* *	25
1962-63 153, 194	90-95	30-35	45-55	15-30	* *	15-25
1963-64 203	90-95	35-45	60-70	25-30	* *	20-25
1964 194	90-95	35-45	60-70	* *	* *	20-25
1965 283, 327	60-70	30-35	60-70	25-35	18-22	25
1965 409	60-70	35-45	90-100	25-35	18-22	20-25
1965-72 153, 194, 230, 250	90-100	30-35	60-70	—	—	20-25*
1966-68 283, 327, 305, 302, 307	65	35	80	30	20	25
1966-70 396, 427	80	50	95-115	30	20	25
1969-72 302, 307, 327, 350	65	45	75	30	20	25*
1971-72 Vega	60	35	65	30	30	15
1971-72 402, 454	80	50	105	30	20	15
CHRYSLER						
1961-70	70	45	85	50	30	30
1971-72 340, 360	95	45	85	40	20	30
1971-72 383, 400, 440	70	45	85	40	30	30
CORVAIR						
1961-64	10-30	20-26	—	None	12-27	20-25
1965-66	32-39	20-26	—	None	22-27	15-20
1967-69	40	25	—	None	25	20
DART						
1960-71 6 cyl.	65	45	85	15-17	10	30
1960-62 V-8	75	40-45	85	50	30	30
1963-69 V-8 318, 273, 340	85	40-45	85	30-40	30	30
1970 V-8 318	85	45		35	24	30
1970-72 V-8 340, 360	95	45	85	40	20	30
1972 6 cyl.	70	45	85	20	10	30

*15 for 1971-72 models

**Center 25-30, End 65-70

TORQUE SPECIFICATIONS FOR PASSENGER CARS

(Figures shown are foot pounds)

CAR MODEL	Cylinder Heads	Connecting Rods	Main Bearings	Manifold Nuts Intake	Manifold Nuts Exhaust	Spark Plugs
DODGE						
1960-68 361, 383, 413, 426, 440	70	45	85	50	30	30
1967-69 318	85	45	85	35	—	30
1969-72 383,440, 400	70	45	85	40	30	30
1970-72 340, 360, 318	95	45	85	40	20	30
1970-71 426	70	75	100	—	24	30
FORD, MERCURY						
1962-64 170 6 cyl., 4 cyl.	65-75	19-24	65-70	None	13-18	15-20
1962-64 223 6 cyl.	105-115	40-45	95-105	23-28	23-28	15-20
1962-64 221, 260	65-75	19-24	65-70	12-15	13-18	15-20
1962-64 292 V-8	65-75	40-45	80-90	23-28	12-18	15-20
1962-63 352, 390	80-90	40-45	95-105	32-35	12-18	15-20
1963-64 406, 427	100-110	53-58	95-105	25-28	12-18	15-20
1964 289	65-70	40-45	60-70	14-16	13-18	15-20
1965 170, 289	70-75	19-24	60-70	—	13-18	15-20
1965 200	70-75	19-24	95-105	—	13-18	15-20
1965-66 240	70-75	40-45	60-70	20-25	20-25	15-20
1965-67 427	100-110	53-58	95-105	32-35	12-18	15-20
1966-72 170, 200 250	70-75	19-24	60-70	—	13-18	15-20
1966-71 352, 390, 410, 428	80-90	40-45•	95-105	32-35	18-24	15-20
1966-68 289 except Hi Perf.	65-72	18-24	60-70	20-22	15-20	15-20
1966-68 289 Hi Perf.	65-72	40-45	60-70	20-22	15-20	15-20
1967-72 240	70-75	40-45	60-70	23-28	23-28	15-20
1969-72 302-2V	65-72	19-24	60-70	23-25	12-16	15-20
1970-71 351-W	95-100	40-45	95-105	23-25	18-24	15-20
1971-72 Pinto 98	65-70	30-35	65-70	12-15	9-12	22-28
1971-72 Pinto 122	65-80	29-34	65-75	12-15	12-15	14-20
1972 351, 400	95-105	40-45	95-105*	21-25	12-16	15-20
1972 429	130-140	40-45	95-105	25-30	28-33	15-20
LINCOLN						
1961-62	95-105	40-45	95-105	18-21	15-21	15-20
1963	95-105	40-45	95-105	25-28	15-21	15-20
1964-65	125-135	40-45	95-105	25	15-21	15-20
1966-67	135-145	40-45	95-105	20-25	15-21	15-20
1968	130-140	40-45	95-105	25-30	15-21	15-20
1969-72	130-140	40-45	95-105	25-30	28-33	15-20

•55 on 428 engine

*35-45 for 3/8" bolt

TORQUE SPECIFICATIONS FOR PASSENGER CARS

(Figures shown are foot pounds)

CAR MODEL	Cylinder Heads	Connecting Rods	Main Bearings	Manifold Nuts Intake	Manifold Nuts Exhaust	Spark Plugs
OLDSMOBILE						
1962-64 88, 98	60-80	32-42	90-120•	22-34	19-25	18-34
1962-63 F-85	45-55	30-35	65-70	25-30	18-24	12-17
1964 V-6	65-70	30-35	65-70	25-35	25-35	25-35
1964-65 V-6	65-70	30-35	65-70	25-35	25-35	25-35
1965 V-8	80	42	80•	35	25	35
1966-71 6 cyl.	95	35	65	25	25	25
1966-72 330, 350	80-85	42	80•	35	25	35
1966-72 400, 425, 455	80-85	42	120	35	25	35
PLYMOUTH						
1960-71 6 cyl.	65-70	45-50	80-85	15	10	30
1960-68 V-8 361, 383, 314, 426	70	45	85	50	30	30
1963-69 V-8 318, 273, 340	85	45	85	30-40	—	30
1967-68 V-8 383, 440	70	45	85	50	30	30
1969-71 V-8 383, 440	70	45	85	40	30	30
1970 V-8 318	85	45	85	35	24	30
1970-71 V-8 340	95	45	85	35	20	30
1971 V-8 318, 360	95	45	85	35	24	30
1970-71 426	70	75	100	—	24	30
1972 6 cyl.	70	45	85	20	10	30
1972 318, 340, 360	95	45	85	40	20	30
1972 400, 440	70	45	85	40	30	30
PONTIAC						
1960-62	95	45	95• •	30-40	25-30	25
1963-66	85-100	40-46	90-110• •	30-45	20-35	25
1967-72 V-8 (exc. 307)	95	43	100• •	40	30	15
1971-72 6 cyl.	95	35	65	25	25	15
1972 307	65	45	75	30	20	15
RAMBLER, A.M.C.						
1960-61 6 cyl.	60-65	27-30	60-70	End 10, Center 25		30
1960-65 V-8	60-65	46-50	85, Rear 55	20-25		30
1961-64 6 cyl. alum.	50-53	27-30	55-58	End 10, Center 25		25
1962-65 6 cyl. L-Head	58-62	27-30	66-70	—	20-25	25-30
1962-65 6 cyl. OHV 195.6	58-62	27-30	66-70	End 10, Center 25		25-30
1965 6 cyl. 232	80-85	27-30	75-85	20-25		25-30
1966-72 6 cyl.	80-85	27-30	75-85	20-25	20-25	25-30

•40 more on rear bolt

••Rear Main 120

TORQUE SPECIFICATIONS FOR PASSENGER CARS

(Figures shown are foot pounds)

CAR MODEL	Cylinder Heads	Connecting Rods	Main Bearings	Manifold Nuts Intake	Manifold Nuts Exhaust	Spark Plugs
A.M.C. (Cont'd.)						
1966 V-8	58-62	46-50	85, Rear 55	20-30	30-35	25-30
1967 V-8	72-77	27-30	95-105	40-45	30-35	25-30
1968-70 V-8 390	90-100	26-30	95-105	40-45	30-35	25-30
1971-72 V-8, 304, 360	105-115	26-30	95-105	40-45	30-35	25-30
1971-72 V-8, 401	105-115	35-40	95-105	40-45	30-35	25-30
STUDEBAKER						
1960-64 6 cyl.	46-50	28-32	88-93	26-30		25-30
1960-64 V-8	55-65	52-54	85-95	26-30		25-30
1965-66 6 cyl.	90-100	30-35	60-70	20-25	25	25-30
1965-66 V-8	60-70	30-35	60-70	25-35	20	25-30
TEMPEST						
1961-63 4 cyl.	85-100	40-46	90-110•	30-45	20-35	15-25
1961-62 V-8	50-55	30-35	65-70	25-30	10-15	15-20
1963-64 V-8	85-100	40-46	90-110•	30-45	20-35	15-25
1964-65 6 cyl.	85-100	30-35	60-70	25-40	20-35	15-25
1965-70 V-8	90-100	40-46	90-110•	35-45	25-35	15-25
1966 6 cyl.	86-100	31-35	90-110	21-35	21-35	15-25
1967-70 6 cyl.	95	33	100	30	30	20
1971-72 See Pontiac						
VALIANT, LANCER						
1960-70 6 cyl.	65	45	85••	15	10	30
1965-69 V-8	85	45	85	30-40	30	30
1970 V-8 318	85	45	85	35	24	30
1971-72 See Plymouth						

•Rear Main 120

••50 for aluminum engine

TORQUE SPECIFICATIONS FOR TRUCK ENGINES

(Figures shown are foot pounds)

MAKE AND MODEL	Cylinder Heads	Connecting Rods	Main Bearings	Spark Plugs
CATERPILLAR				
1140, 1145, 1150, 1160	95	65	175	—
1670	165-175	85	155	—
1673-B	155-165	85	155	—
1673-C	170-180	30•	175	—
1674	185	20•	220	—
1676	180	50•	350	—
1693	300	20•	350	—

•Plus 90° turn

TORQUE SPECIFICATIONS FOR TRUCK ENGINES

(Figures shown are foot pounds)

MAKE AND MODEL	Cylinder Heads	Connecting Rods	Main Bearings	Spark Plugs
CHEVROLET				
4-153, 6-194	90	30	65	25
6-230	90	40	65	25
6-235, 261	90	40	105	25
6-250, 292	95	40	65	25••
8-265	65	30	65	25
8-283, 327	65	35	80	25
8-322	65	40	105	25
8-348, 409	65	40	100	25
8-366	80	50	115	25
8-396, 427	80	50	115	25••
V-6 401, 478	68	68	Rear 90 Others 140	25••
307, 350	65	45	70	25
1971-72 350	65	35	70	15
1971-72 366, 427	80	55	100	15
CUMMINS				
J (2 valve 11/16 capscrew)	240-260	30*	45-50*	—
J and C (4 valve)	390-400	30*	45-50*	—
H and NH (4⅞"-5⅛")	460-480	50-55*	140-145**	—
NH (5½")	280-300	50-55*	140-145**	—
V-12 (5⅛")	440-460	140	120-125*	—
V-12 (5½")	315-335	140	120-125*	—
V6-200, V8-265	175-185	60-65*	170-180*	—
V-903	280-300	60-65*	170-180*	—
V8-350, VT8-430	175-180	75-80*	170-180*	—
V6-140, V8-185	100-105	20-25*	175-185	—
L	550***	95-105*	100-105*	—
DODGE				
6-170, 225, 251	65	45	85	30
6-230, 265	70	45	85	30
8-259, 270, 273, 315, 318, 331, 354	85	45	85	30
8-361, 383, 413	70	45	85	30
6-413	65	75	85	30
6-198	65	45	85	30
V-8 318, 360	95	45	85	30•
V-8 400, 361, 413	70	45	85	30

*Plus 60° turn
•20 for 18 MM

**Plus 30° turn

***650 on push tube side.
••15 for tapered seat

TORQUE SPECIFICATIONS FOR TRUCK ENGINES

(Figures shown are foot pounds)

MAKE AND MODEL	Cylinder Heads	Connecting Rods	Main Bearings	Spark Plugs
FORD				
1960-63 8-401, 477, 543	130-150	60-65	150-164	15-20
1961-66 6-144, 170	70-75	60-70	75-85	15-20
1961-64 8-292	70-75	40-45	80-90	15-20
1962-64 6-223, 262	105-115	40-45	90-105	15-20
1962-63 8-302, 332	105-115	40-45	120-130	15-20
1964-65 8-401, 477, 534	170-180	60-65	150-165	15-20
1964-69 8-330, 361, 391	80-90	40-45	95-105	15-20
1965-72 6-240, 300	70-75	40-45	60-70	15-20
1966-69 8-401, 477, 534	170-180	60-65	130-150	15-20
1967-72 170	70-75	19-24	60-70	15-20
1968-72 302	65-72	19-24	60-70	15-20
G.M.C.				
4-153, 6-194	90-95	30-35	60-70	20-25
6-230, 6-292	90-95	35-45	60-70	20-25
6-248, 6-270	90-100	40-45	90-100	20-25
8-288, 8-316, 8-347	90-95	45	Rear 140 Others 100	15-20
6-302	90-100	40-45	90-100	15-20
V-6 305, 351, 401, 478, V-12 702	65-72	65-75	Rear 90 Others 140	22-27
8-324, 370	65-70	40-50	Rear 120 Others 95	25
8-336	90-95	45	Rear 140 Others 100	23-27
6-360	80-90	65-75	90-100	15-20
6-426	80-90	80	90-100	23-27
6-503	75-80	80	90-100	23-27
8-637	130-135	55-65	170-180	23-27
INTERNATIONAL				
4-152	75-80	40-45	75-80	28-30
A-55	45	35	77-80	28-30
BD-220, 240, BG-220, 241, BD-264, 265	85-95	45-55	75-85	28-30
BD-269, 282, 308, RD Series	100-110	70	100-110	28-30
SD-220, 240	85-95	45-55	75-85	28-30
V-266, 304, 345	90-100	45-55	75-85	28-30
V-401, 461, 478, V-549	80-90	60-70	100-110	28-30

TORQUE SPECIFICATIONS FOR TRUCK ENGINES

(Figures shown are foot pounds)

MAKE AND MODEL	Cylinder Heads	Connecting Rods	Main Bearings	Spark Plugs
JEEP				
L-Head 4	60-70	7/16" bolt 55 3/8" bolt 40	65-75	25-30
F-Head 4	60-70	35-45	65-75	25-30
L-Head 6	30-35	40-45	85-95	25-30
6-230	90-95	40-45	85-95	20-30
6-232	80-85	46-50	75-85	25-30
V8-327	58-62	27-30	Rear 55 Others 85	25-30
MACK				
291, 331, 401, 402	100	60-65	100-105	30
431A	Short 100 Long 130	60-65	150	30
438, 464A, B, 510A, B, C, 540	Short 100 Long 130	140-150	150	30
707A, B, C	150	150	150	30
WHITE				
55A	60-65	60-65	90-95	28-32
110A, 6-130A, 145A, 170A, 185A, 8-235A	100-105	65-70	85-90	30
116A, 120A, 130A, 140A	105-110	40-65	70-75	30
150A, 230A, 450A, 460A, 462A	105-110	50-65	80-90	30
6-186A, 200A	100-105	65-70	85-90	30
250A	105-110	50-65	70-75	30
260A, 280A, 290A	105-110	70-75	70-75	30
370A, 380A, 390A, 470A, 477A, 490A, 531A	105-110	80-120	80-90	28
90AA	3/8" bolt 40 1/2" bolt 100	75	100	30
91AA	70-75	40	110	30
96A, 97A	65	45	85	30
98A	85	45	85	30

TORQUE SPECIFICATIONS FOR FOREIGN CARS

MAKE AND MODEL	Cylinder Heads		Connecting Rods		Main Bearings		Manifold Nuts		Spark Plugs	
	Ft. Lbs.	Mkgs.	Ft. Lbs.	Mkgs.	Ft. Lbs.	Mkgs.	Ft. Lbs.	Mkgs.	Ft. Lbs.	Mkgs.
AUSTIN-HEALY										
Sprite MK IV	50	6.9	40	5.5	60	8.3	15	2.1	15	4.2
COLT										
All	52	7.3	46	6.4	38	5.3	13	1.8	18	2.5
CRICKET										
All	56	7.8	29	4.0	55	7.6	16	2.2	12	1.7
DATSUN										
1000LB-10	42	5.8	25	3.4	37	5.1	18	2.5	28	3.9
1300, 1600	40	5.5	22	3.0	36	5.0	20	2.8	13	1.8
1800	62	8.6	36	5.0	76	10.5	22	3.0	26	3.6
2000 PL-130	48	6.6	40	5.5	78	10.8	24	3.3	30	4.1
2000 SRL-311	65	9.0	65	9.0	65	9.0	22	3.0	13	1.8
2300	42	5.8	22	3.0	55	7.6	22	3.0	13	1.8
FIAT										
500F, L	24	3.3	25	3.5	15	2.1	18	2.5	20	2.8
600D, 850 Super, Special	28	3.9	25	3.5	45	6.2	14	1.9	20	2.8
850 Coupe, Spider	36	5.0	29	4.0	44	6.1	14	1.9	20	2.8
1100	58	8.0	25	3.5	45	6.2	14	1.9	20	2.8
128	69	9.5	37	5.1	62	8.6	20	2.8	28	3.9
124, 125	56	7.7	37	5.1	60	8.3	18	2.5	30	4.1
130	80	11.1	55	7.6	80	11.1	18	2.5	28	3.9
Dino Spider, Coupe	55	7.6	58	8.0	72	10.0	14	1.9	22	3.0
1600	58	8	40	5.5	58	8	18	2.5	29	4

TORQUE SPECIFICATIONS FOR FOREIGN CARS

MAKE AND MODEL	Cylinder Heads		Connecting Rods		Main Bearings		Manifold Nuts		Spark Plugs	
	Ft. Lbs.	Mkgs.	Ft. Lbs.	Mkgs.	Ft. Lbs.	Mkgs.	Ft. Lbs.	Mkgs.	Ft. Lbs.	Mkgs.
FORD (English)										
Escort 1100, 1300, Capri 1300	68	9.4	33	4.6	68	9.4	17	2.3	26	3.6
Escort Twin Cam	63	8.7	45	6.2	58	8.0	—	—	26	3.6
Cortina 1300, 1600, Capri 1600	68	9.4	23	3.2	58	8.0	17	2.3	26	3.6
Cortina Lotus	63	8.7	45	6.2	58	8.0	—	—	26	3.6
Corsair, Zephyr, Zodiac	68	9.4	23	3.2	58	8.0	15	2.1	26	3.6
JAGUAR										
XJ-6	54	7.5	37	5.1	125	17.3	—	—	—	—
240, 420G, E, S2	54	7.5	37	5.1	83	11.5	—	—	—	—
MG										
200, 220	65	9.0	40	5.5	65	9.0	—	—	25	3.5
230, 250 Models	65	9.0	45	6.2	58	8.0	—	—	25	3.5
280S, SE, SL, 300 SEL	72	10.0	44	6.1	58	8.0	—	—	25	3.5
600	58	8.0	36	5.0	60	8.3	—	—	25	3.5
MERCEDES-BENZ										
Midget MK III	50	6.9	40	5.5	60	8.3	15	2.1	30	4.1
1300 MK II	40	5.5	35	4.8	60	8.3	15	2.1	30	4.1
MGB	44	6.1	40	5.5	70	9.7	25	3.5	30	4.1
MGC	75	10.4	50	6.9	75	10.4	15	2.1	30	4.1
OPEL										
Kadett, GT-1SR	33	4.6	20	2.8	47	6.5	—	—	—	—
Olympia, Record 7S, 9S	65	9.0	36	5.0	80	11.1	—	—	—	—
Record Sprint, 6 cyl.	72	10.0	36	5.0	80	11.1	—	—	—	—
GT-1, 9S	58	8.0	36	5.0	72	10.0	—	—	—	—
Commodore, Kapitan, Admiral	72	10.0	36	5.0	72	10.0	—	—	—	—
Diplomat	65	9.0	44	6.1	72	10.0	—	—	—	—

TORQUE SPECIFICATIONS FOR FOREIGN CARS

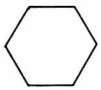
MAKE AND MODEL	Cylinder Heads		Connecting Rods		Main Bearings		Manifold Nuts		Spark Plugs	
	Ft. Lbs.	Mkgs.	Ft. Lbs.	Mkgs.	Ft. Lbs.	Mkgs.	Ft. Lbs.	Mkgs.	Ft. Lbs.	Mkgs.
PEUGEOT										
204, B, C	40	5.5	29	4.0	38	5.3	—	—	20	2.8
204 BD	44	6.1	27	3.7	38	5.3	—	—	35	4.8
404 U, L	51	7.0	31	4.3	54	7.5	—	—	18	2.5
404 LD, U6D	52	7.2	45	6.2	75	10.4	15	2.1	35	4.8
504	50	6.9	29	4.0	54	7.5	—	—	16	2.2
PORSCHE										
912	22	3.0	33	4.6	29	4.0	—	—	18	2.5
911T, E, S	23	3.2	36	5.0	25	3.5	—	—	18	2.5
911R, 906, 910	24	3.3	44	6.1	58	8.0	—	—	—	—
RENAULT										
R-4, R-1120	47	6.5	25	3.5	44	6.1	—	—	13	1.8
R-6, R-8, R1132, 8S	44	6.1	25	3.5	44	6.1	—	—	13	1.8
Gordini 1300	54	7.5	33	4.6	47	6.5	—	—	13	1.8
10 Luxe, Super, R1190	44	6.1	25	3.5	44	6.1	—	—	13	1.8
16 Luxe, 16TA	52	7.2	33	4.6	47	6.5	—	—	22	3.0
16TS	60	8.3	33	4.6	47	6.5	—	—	22	3.0
R-1150, R-1152, R-1153	53	7.3	30	4.5	45	6.5	15	2.0	—	—
R-1151	58	8.0	30	4.5	45	6.5	22	3.0	—	—
R-1172, R-1331	58	8.0	30	4.5	45	6.5	15	2.0	—	—
SAAB										
95, 96, Monte Carlo	68	9.5	25	3.5	72	1.0	15	2.1	25	3.5
99	54	7.5	40	5.5	58	8.0	18	2.5	15	2.0
SIMCA										
1000 Series	47	6.5	17	2.3	47	6.5	13	1.8	20	2.8
1100 Series	47	6.5	27	3.7	47	6.5	13	1.8	22	3.0

TORQUE SPECIFICATIONS FOR FOREIGN CARS

MAKE AND MODEL	Cylinder Heads		Connecting Rods		Main Bearings		Manifold Nuts		Spark Plugs	
	Ft. Lbs.	Mkgs.	Ft. Lbs.	Mkgs.	Ft. Lbs.	Mkgs.	Ft. Lbs.	Mkgs.	Ft. Lbs.	Mkgs.
SIMCA (Continued)										
1200 S	45	6.2	31	4.3	47	6.5	9	1.2	22	3.0
1301 LS, GL	47	6.5	22	3.0	40	5.5	14	1.9	21	2.9
1501 Series	58	8.0	33	4.6	47	6.5	14	1.9	21	2.9
TOYOTA										
Corolla 1100	45	6.2	33	4.6	45	6.2	18	2.5	13	1.8
Corona 1600, 1900	80	11.1	44	6.1	76	10.5	22	3.0	14	1.9
2000 GT, Crown 2300	—	—	33	4.6	72	10.0	25	3.5	13	1.8
TRIUMPH										
Herald 1200, 1300	44	6.1	40	5.5	53	7.3	25	3.5	15	2.1
1300 TC, Spitfire MK III	44	6.1	40	5.5	53	7.3	—	—	15	2.1
TR-6, GT-6, Vittesse MK II	68	9.4	40	5.5	58	8.0	25	3.5	15	2.1
2000	44	6.1	40	5.5	58	8.0	21	2.9	15	2.1
VOLKSWAGEN										
All	23	3.2	24	3.3	—	—	Int. 5 Exh. 14	.7 1.9	25	3.5
VOLVO										
All	65	9.0	40	5.5	90	12.4	—	—	30	4.1

GENERAL TORQUE SPECIFICATION CHART*

(When SAE 10 Oil is used as a lubricant)

Material	SAE 2 Mild Steel		SAE 5		SAE 8		Socket Head Cap Screw	
Minimum Tensile Strength	74,000 PSI		120,000 PSI		150,000 PSI		160,000 PSI	
Steel Grade Symbols								
Bolt Diameter	Torque — foot pounds and meter kilograms							
	Ft. Lbs	Mkgs.	Ft. Lbs	Mkgs.	Ft. Lbs	Mkgs.	Ft. Lbs	Mkgs.
1/4"	6	.8	10	1.4	14	1.9	16	2.2
5/16"	12	1.7	19	2.6	29	4.0	33	4.6
3/8"	20	2.8	33	4.6	47	6.5	54	7.5
7/16"	32	4.4	54	7.5	78	10.8	84	11.6
1/2"	47	6.5	78	10.8	119	16.5	125	17.3
9/16"	69	9.5	114	15.8	169	23.4	180	24.9
5/8"	96	13.3	154	21.3	230	31.8	250	34.6
3/4"	155	21.4	257	35.5	380	52.6	400	55.3
7/8"	206	28.5	382	52.8	600	83.0	640	88.5
1"	310	42.9	587	81.2	700	96.8	970	134.2
1 1/8"	480	66.4	794	109.8	1430	197.8	1530	211.6
1 1/4"	675	93.4	1105	152.8	1975	273.1	2130	294.6

*Use only when manufacturers specifications are not available. These values are for general applications.

GENERAL TORQUE SPECIFICATION CHART FOR METRIC FASTENERS*

(When SAE 10 Oil is used as a lubricant)

Minimum Tensile Strength		71,160		113,800		142,000		170,000	
Steel Grade Symbols		5D		8G		10K		12K	
Bolt Diameter		Torque in foot pounds and meter kilograms							
Millimeters	Decimal	Ft. Lbs	Mkgs.	Ft. Lbs	Mkgs.	Ft. Lbs	Mkgs.	Ft. Lbs	Mkgs.
6 mm	.236	5	.7	9	1.3	11	1.5	13	1.8
8 mm	.315	12	1.7	21	2.9	26	3.6	32	4.4
10 mm	.394	23	3.2	40	5.5	50	6.9	60	8.3
12 mm	.472	40	5.5	70	9.7	87	12.0	105	14.5
14 mm	.551	65	9.0	110	15.2	135	18.7	160	22.1
16 mm	.630	100	13.8	170	23.5	210	29.0	250	34.5
18 mm	.709	130	17.9	225	31.1	275	38.0	335	46.2
22 mm	.866	200	27.6	345	47.6	425	58.8	515	71.2

*Use only when manufacturers specifications are not available.
These are general specifications.

GUARANTEE

A guarantee card is furnished with each Torqometer or click-type torque wrench which should be filled in and returned to put the guarantee into effect.

REPAIR SERVICE

If Your Torqometer or Click-Type Torque Wrench Needs Repairs:

1. Either send it to the nearest *Snap-on* Branch Office (see back cover of this booklet), or give it to your *Snap-on* representative. Do not attempt to repair it yourself.
2. The Torqometer or torque wrench will be sent to an authorized *Snap-on* Repair Center where it will be put in first class condition, (or replaced if necessary).
3. During the 90 day guarantee period, no charges will be made for repairs unless they are caused by obvious abuse. A nominal charge for repairs not covered by the guarantee will be made on the basis of actual cost. The repaired Torqometer or torque wrench will carry a new 90 day guarantee.
4. A series of torque wrench testers is available from *Snap-on* for checking the accuracy of Torqometers and other torque wrenches. See your Snap-on representative for more information on torque wrench testers.

METRIC CONVERSION CHART

The chart below can be used to convert foot-pounds to meter kilograms. The right hand digit of the foot-pound figure is read from the top line down to the line of the even quantity shown in the left hand column. Thus 45 is on the "40" line under "5" which shows 6.22 Mkgs.

Ft.	0	1	2	3	4	5	6	7	8	9
Lbs.	Mkgs	Mkgs	Mkgs	Mkgs	Mkgs	Mkgs	Mkgs	Mkgs	Mkgs	Mkgs
0	0	.14	.28	.42	.55	.69	.83	.97	1.11	1.25
10	1.38	1.52	1.66	1.80	1.94	2.07	2.21	2.35	2.49	2.63
20	2.77	2.90	3.04	3.18	3.32	3.46	3.60	3.73	3.87	4.01
30	4.15	4.29	4.43	4.56	4.70	4.84	4.98	5.12	5.26	5.39
40	5.53	5.67	5.81	5.95	6.09	6.22	6.36	6.50	6.64	6.78
50	6.92	7.05	7.19	7.33	7.47	7.61	7.75	7.88	8.02	8.16
60	8.30	8.44	8.57	8.71	8.85	8.90	9.13	9.27	9.40	9.54
70	9.68	9.82	9.96	10.09	10.23	10.37	10.51	10.65	10.79	10.92
80	11.01	11.20	11.34	11.48	11.62	11.75	11.89	12.03	12.17	12.31
90	12.45	12.59	12.73	12.86	13.00	13.14	13.28	13.42	13.55	13.69
100	13.83	13.97	14.11	14.25	14.38	14.52	14.66	14.80	14.94	15.08
110	15.21	15.35	15.49	15.63	15.76	15.90	16.04	16.18	16.32	16.46

Note: Conversion figure is Ft.-Lbs. × .1383. This can be used for readings in excess of 119 foot-pounds.

SNAP-ON TOOLS CORPORATION
GENERAL OFFICES LOCATED AT KENOSHA, WISCONSIN 53140

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ALBANY, N.Y. 12205
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ANAHEIM, CALIF. 92806
1521 N. Placentia Ave.

ATLANTA, GA. 30324
2075 Liddell Drive, N.E.

BALTIMORE, MD. 21205
4503 E. Monument St.

BOSTON AREA 01752
Bilancieri Industrial Park
Marlboro, Mass.

BUFFALO, N.Y. 14217
3147 Delaware Ave.

CHARLOTTE, N.C. 28210
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